EXAMINER'S AMENDMENT / COMMENT

Examiner's Amendment

Examiner's amendment to the record appears below. Should the changes be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be filed no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephonic interview with James H. Morris, Reg. No. 34,681 on April 29, 2009.

In the claims:

Claims 1, 2, 8, 14-16, 18, 19, 21-23, 25, 26, and 28 are currently

amended.

Claims 1, 2, 4, 5, 7-9, 11, 12, 14-16, 18, 19, 21-23, 25, 26, and 28 remain

in the application.

1.   (Currently Amended) A method for transferring control between a first network

interface controller and at least a second network interface controller in a multiple

network interface device, the method comprising:

after the first network interface controller sends a data request and an identifier

associated with a memory location allocated to receive requested data in the multiple

network interface device to a second device, and the identifier and an associated data

field comprising the requested data are subsequently received by the second network

interface controller in the multiple network interface device from the second device,

receiving, by [[a]] an RDMA program component of the multiple network

interface device, the identifier associated with the memory location in the multiple

network interface device and without the associated data field, from the second device

network interface controller, wherein the second network interface controller has no

knowledge of the identifier and the associated data field, and wherein the first network

interface controller and the second network interface controller operate under a Remote

Direct Memory Access (RDMA) protocol;

querying the first network interface controller to supply the <u>RDMA</u> program

component with a list of valid identifiers generated by the first network interface

controller <u>and associated memory locations</u>, wherein each identifier from the list of valid

identifiers is associated with a location in a memory of the multiple network interface

device;

determining<u>, by the RDMA program component,</u> whether the first network

interface controller generated the identifier, wherein<u>,</u> when the first network <u>interface</u>

controller generated the identifier<u>,</u> the list of valid identifiers comprises the identifier;

when it is determined that the first network interface controller generated

the identifier, transmitting the memory location associated with the identifier to the

second network interface controller, wherein the second network interface controller

subsequently transmits the associated data field <u>comprising the requested data</u> to the

memory location<u>, and invalidating the identifier</u>; and

when the identifier is not found among the list of valid identifiers,

invalidating the identifier and discarding the associated data field.

2.   (Currently Amended) The method of claim 1, ~~further comprising invalidating~~

<u>wherein</u> the identifier <u>is invalidated</u> under control of a bit field added to the identifier and

the associated data field received from the second device.

3.   (Canceled)

4.   (Previously Presented) The method of claim 1, wherein the memory is Random

Access Memory.

5.   (Previously Presented) The method of claim 1, wherein the program component

is a computer operating system.

6.   (Canceled)

7.   (Previously Presented) The method of claim 1, wherein the first network interface

controller and the second network interface controller operate under the RDMA protocol

over TCP/IP protocol.

8.   (Currently Amended) A method for transferring control between a first network

interface controller and at least a second network interface controller in a host computer

including the first network interface controller and the second network interface

controller, the method comprising:

        receiving an identifier and an associated data field in a packet from a remote

computer by the second network interface controller, the identifier generated by the first

network interface controller and associated with a memory location in the host

computer, wherein the second network interface controller has no knowledge of the

identifier and the associated data field, and wherein the first network interface controller

and the second network interface controller operate under a Remote Direct Memory

Access (RDMA) protocol;

extracting the identifier from the received packet;

after the identifier has been extracted from the received packet, passing the

identifier associated with the memory location to an RDMA program component of the

host computer;

querying, by the RDMA program component, the first network interface controller

for a list of valid identifiers generated by the first network interface controller <u>and</u>

<u>associated memory locations</u>, wherein each identifier from the list of valid identifiers is

associated with a memory location in a memory of the host computer;

searching the list of valid identifiers for the identifier;

when the list of valid identifiers includes the identifier received from the remote

computer, receiving, by the second network interface controller, the memory location

associated with the identifier, wherein the second network interface controller

<u>subsequently</u> transmits the associated data field to the memory location<u>, and invalidates</u>

<u>the identifier</u>; and

when the list of valid identifiers does not include the identifier received from the

remote computer, invalidating the identifier received from the remote computer and

discarding the associated data field.

9.   (Previously Presented) The method of claim 8, wherein the identifier is

invalidated under control of a bit field added to the identifier and the associated data

field received from the remote computer.

10.   (Canceled)

11.   (Previously Presented) The method of claim 8, wherein the memory is Random

Access Memory.

12.   (Previously Presented) The method of claim 8, wherein the program component

is a computer operating system.

13.   (Canceled)

14.   (Currently Amended) The method of claim 8, wherein the first network interface

controller and the second network interface controller operate under the RDMA protocol

over TCP/IP protocol.

15.   (Currently Amended) A computer readable storage medium having stored therein

instructions for performing acts for transferring control between a first network interface

controller and at least a second network interface controller in a multiple network

interface device, the acts comprising:

after the first network interface controller sends a data request and an identifier

associated with a memory location allocated to receive requested data in the multiple

network interface device, to a second device, and the identifier and an associated data

field comprising the requested data are subsequently received by the second network

interface controller in the multiple network interface device from the second device,

receiving, by [[a]] an RDMA program component in the multiple network

interface device, the identifier associated with the memory location in the multiple

network interface device and without the associated data field, from the second device

network interface controller, wherein the second network interface controller has no

knowledge of the identifier and the associated data field, and wherein the first network

interface controller and the second network interface controller operate under a Remote

Direct Memory Access (RDMA) protocol;

querying the first network interface controller to supply the RDMA program

component with a list of valid identifiers generated by the first network interface

controller and associated memory locations, wherein each identifier from the list of valid

identifiers is associated with a memory location in a memory of the multiple network

interface device;

determining, by the RDMA program component, whether the first network

interface controller generated the identifier, wherein, when the first network interface

controller generated the identifier, the list of valid identifiers comprises the identifier;

when it is determined that the first network interface controller generated

the identifier, transmitting the memory location associated with the identifier to the

second network interface controller, wherein the second network interface controller

subsequently transmits the associated data field comprising the requested data to the

memory location, and invalidating the identifier; and

when the identifier is not found among the list of valid identifiers,

invalidating the identifier and discarding the associated data field.

16.   (Currently Amended) The computer readable storage medium of claim 15,

wherein the identifier is invalidated under control of a bit field added to the identifier and

the associated data field received from the second device.

17.   (Canceled)

18.   (Currently Amended) The computer readable storage medium of claim 15,

wherein the memory comprises Random Access Memory.

19.   (Currently Amended) The computer readable storage medium of claim 15,

wherein the program component is a computer operating system.

20.   (Canceled)

21.   (Currently Amended) The computer readable <u>storage</u> medium of claim 15,

wherein the first network interface controller and the second network interface controller

operate under the RDMA protocol over TCP/IP protocol.

22.   (Currently Amended) A computer readable <u>storage</u> medium having stored therein

instructions for performing acts for transferring control between a first network interface

controller and at least a second network interface controller in a host computer including

the first network interface controller and the second network interface controller, the

acts comprising:

          receiving an identifier and an associated data field in a packet from a remote

computer by the <s>at least a</s> second network interface controller, the identifier generated

by the first network interface controller and associated with a memory location in the

host computer, wherein the second network interface controller has no knowledge of the

identifier and the associated data field, and wherein the first network interface controller

and the second network interface controller operate under a Remote Direct Memory

Access (RDMA) protocol;

          extracting the identifier from the received packet;

          after the identifier has been extracted from the received packet, passing the

identifier associated with the memory location to [[a]] <u>an RDMA</u> program component of

the host computer;

          querying, by the <u>RDMA</u> program component, the first network interface controller

for a list of valid identifiers generated by the first network interface controller <u>and</u>

<u>associated memory locations</u>, wherein each identifier from the list of valid identifiers is associated with a memory location in a memory of the host computer;

searching the list of valid identifiers for the identifier;

when the list of valid identifiers includes the identifier received from the remote computer, receiving, by the second network interface controller, the memory location associated with the identifier, wherein the second network interface controller <u>subsequently</u> transmits the associated data field to the memory location<u>, and invalidates the identifier</u>; and

when the list of valid identifiers does not include the identifier received from the remote computer, invalidating the identifier received from the remote computer and discarding the associated data field.

23.   (Currently Amended) The computer readable <u>storage</u> medium of claim 22, wherein the identifier is invalidated under control of a bit field added to the identifier and the associated data field received from the remote computer.

24.   (Canceled)

25.   (Currently Amended) The computer readable <u>storage</u> medium of claim 22, wherein the memory comprises Random Access Memory.

26.   (Currently Amended) The computer readable <u>storage</u> medium of claim 22,

wherein the program component is a computer operating system.

27.   (Canceled)

28.   (Currently Amended) The computer readable <u>storage</u> medium of claim 22,

wherein the first network interface controller and the second network interface controller

operate under the RDMA protocol over TCP/IP protocol.

Allowed Claims

Claims 1, 2, 4, 5, 7-9, 11, 12, 14-16, 18, 19, 21-23, 25, 26, and 28 are allowed.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

none of the qualifying prior art references of record, taken alone or in combination, disclose or reasonably suggest: a combination of elements as claimed in independent claims 1, 8, 15, and 22, wherein the RDMA program component receives only the identifier from the second network interface controller when the second network interface controller has no knowledge of said identifier and the associated data field. As persuasively argued by applicant at page 12 of remarks, as filed: *"Craft describes passing **the whole packet** to the INIC device driver which contradicts to a purpose of the RDMA protocol"*. *"Sending only an identifier associated with a memory location, which is actually not taught by Craft, would make processing of Craft impossible because Craft is directed to processing of **packets** by INICs. At the same time, sending STag of AAPA along with the packet of Craft will not result in limitations of claim 1 because such combination would no longer describe processing according to the RDMA protocol."* Specifically, the prior art of record fails to disclose or reasonably suggest receiving, by an RDMA program component of the multiple network interface device, the identifier associated with the memory location in the multiple network interface device without the associated data field, from the second network interface controller, as such is recited in independent claims 1 and 15 in combination with the other claim elements;

and after the identifier has been extracted from the received packet, passing the

identifier associated with the memory location to an RDMA program component of the

host computer, as such is recited in independent claims 8 and 22 in combination with

the other claim elements.

Any comments considered necessary by applicant must be submitted no later

than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to OLEG SURVILLO whose telephone number is

(571)272-9691. The examiner can normally be reached on M-Th 8:30am - 6:00pm; F

8:30am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Andrew Caldwell can be reached on 571-272-3868. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Oleg Survillo   /Andrew Caldwell/
                                                           Supervisory Patent Examiner, Art
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